

We claim:

1. A method of fabricating a MOSFET, comprising:
forming a trench in a surface of a semiconductor, the trench defining a mesa;
forming a first insulating layer along a wall of the trench;
forming a gate in the trench, the gate being insulated from the semiconductor by the insulating layer;
performing a plurality of implantations of dopant of a first conductivity type into the mesa to form a body region, wherein each of the implantations has a different energy; and
implanting dopant of a second conductivity type into the mesa to form a source region.
2. The method of claim 1, wherein each of the implantations is performed at a dose that is the same as the dose for another of the implantations.
3. The method of claim 2, wherein the dose of the implantations is about $7 \cdot 10^{12} \text{ cm}^{-2}$.
4. The method of claim 3, wherein the different energies respectively of the implantations comprise 1 MeV, 700 keV, 525 keV, 375 keV, 225 keV and 125 keV.
5. The method of claim 1, wherein a first of the implantations is at a first dose, and a second of the implantations is as a second dose, the second dose differing from the first dose.
6. The method of claim 1, wherein respective doses and energies of the implantations are such that the implantations in combinations provide a uniform doping for the body region.
7. The method of claim 1, further comprising completing the MOSFET without performing a process to diffuse the dopant of the first conductivity type in the body region, whereby energies of the implantations control a depth of a body-drain junction at an interface between the body region and an underlying portion of the semiconductor.

8. The method of claim 1, wherein forming the trench comprises:
forming a hard mask on the semiconductor; and
etching the semiconductor through an opening in the hard mask to form the trench.
9. The method of claim 8, wherein a maximum implant energy for the implantations causes dopant of the first type to penetrate through the hardmask into the semiconductor to a depth desired for a junction between the body region and a drain region.
10. The method of claim 8, wherein forming the gate comprises introducing polysilicon into the trench.
11. The method of claim 10, further comprising:
with the hard mask in place, oxidizing an exposed surface of the polysilicon to form a second oxide layer at the top of the trench, the second oxide layer extending down into the trench;
removing the hard mask; and
depositing a metal layer on a surface of the second oxide layer and the surface of the mesa.
12. The method of claim 1, further comprising:
forming a second insulating layer over the mesa;
etching an opening in the second insulating layer; and
depositing a metal layer into the contact opening to form an electrical contact with the source region.